TEC Preamp Shaper Power$_i$ Consumption: **Oct 07,1996**

Specifications:

Inputs: 32
Outputs: 64 [1 De/Dx and 1 TR output per input]
Number of TEC-PS Chips / board : 4
Number of Line Drivers / board : 64

Power Numbers:

TEC-PS:
Current consumption per TEC-PS chip:

Vdd : 57 mA
Vss_{ii} : 52 mA

Current consumption per TEC-PS board:

Vdd : 228 mA
Vss_{ii} : 208 mA

Line Drivers:

Quiescent Current per driver : 2.75 mA
Total quiescent current per board : 176 mA

The Transmission Line is a 100 ohm system:

Case A: DeDx at its maximum output and TR at 1/5th of the DeDx output:
1 channel:
DeDx @ MAX[+2.5 or -2.5] : 25 mA
TR @ 1/5th of DeDx : 5 mA
32 Channel:
DeDx : 800 mA
TR : 160 mA

Total current consumption in case A: $I_{DeDx} + I_{TR} + I_q$

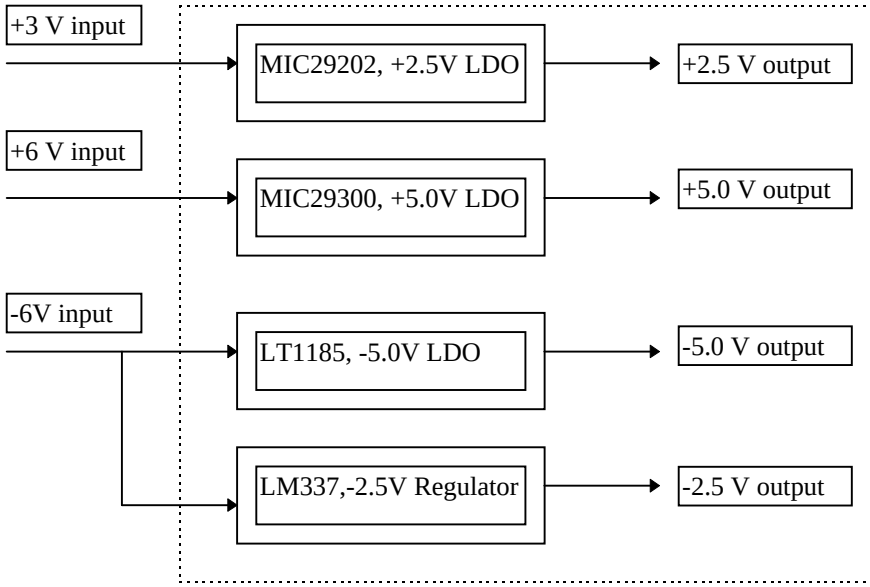
800 + 160 + 176
Total Case A: 1136mA

Case B: DeDx at its maximum output and TR at its maximum$_{iii}$:
1 channel:
DeDx @ MAX[+2.5 or -2.5] : 25 mA
TR @ MAX[+2.5 or -2.5] : 25 mA
32 Channel:
DeDx : 800 mA
TR : 800 mA

Total current consumption in case A: $I_{DeDx} + I_{TR} + I_q$

800 + 800 + 176
Total Case A: 1776mA

Regulation Scheme:



Current required from the Unregulated supply$_{iv}$:

+3 Volts : 228 mA + 15 mA = 243 mA
+6 Volts : 2 (800 mA) + 176mA + 35 mA = 1811 mA
-6 Volts : 2 (800 mA) + 176 mA + 208 mA + 5mA = 1989 mA

TEC-PS Front End current requirement:

Unregulated Supply	I peak	Iquiescent	Units
+3V	243	243	mA
+6V	1811	211	mA
-6V	1989	389	mA

Notes:

i) This power consumption numbers is not complete, as components like DAC and serial interface logic are not included.

ii) Actual current flow is I_{vdd} = 56.74 mA
I_{vss} = 52.19 mA
I_{gnd} = 4.55 mA
Ground current was neglected for simplicity:

iii) DeDx has a gain of 5 over the TR output, when TR goes to its maximum, DeDx will be clamped to its saturation output voltage.

iv) This Current includes the regulator current,
+3V : $I_{vdd,TECPS} + I_{reg}$
+6V: $I_{vcc,driver,DeDx} + I_{vcc,driver,TR} + I_{drivers,quiescent} + I_{reg}$
-6V: $I_{vee,driver,DeDx} + I_{vee,driver,TR} + I_{drivers,quiescent} + I_{vss,TECPS} + I_{reg}$